

PRELIMINARY NOTE ON A NEW FAMILY OF THE CIDAROIDEA¹

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TWO PLATES

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In a recent paper I described a very peculiar form of the Cidarid sea-urchin under the name *Psychocidaris ohshimai*. This species is a very unusual form, having imperforate primary tubercles and lacking peristomial interambulacral plates. Those characters were then regarded to be of a generic significance. Since then I have re-examined the said characters more thoroughly in four specimens (of which two were collected by me in the neighbourhood of Bonin Islands this summer), and the species now seems to me to represent a new family.

Before proceeding further I wish sincerely to acknowledge my indebtedness to Professor Hiroshi Ohshima for his generosity in sending me for collection to the islands in the years 1935 and 1936, and also to Messrs. Michitomo Tanaka and Kensaburo Hayashi who kindly helped me in many ways during my sojourn there.

Family PSYCHOCIDARIDAE nov.

Diagnosis: Primary tubercles imperforate. On the peristome ambulacral plates only are present in double series, no plates present interradially.

Type genus: *Psychocidaris* Ikeda, 1935

Genus *Psychocidaris* Ikeda, 1935.

Psychocidaris Ikeda, Proc. Imp. Acad., Tokyo, Vol. 11, p. 386.

Diagnosis: Primary tubercles imperforate, non-crenulate. Pores non-conjugate. Upper primary spines acorn-shaped, ambital ones longer and somewhat flattened; all primaries but adoral club-shaped, adorned with very coarse thorns which are arranged quite irregularly.

¹ Contributions from the Zoological Laboratory, Kyushu Imperial University, No. 90.

Genotype: *Psychocidaris ohshimai* Ikeda, 1935

Of those specimens there are some examples with a few uppermost primary tubercles which are perforated. This fact was not shown in my previous paper (1935), for I could not find out any perforate primary tubercle on the specimens then examined. As a matter of fact, we see here the examples which appear to be more closely related to species of the fossil genera *Tylocidaris*, *Caenocidaris* and *Merocidaris* than any other recent forms; namely, Mortensen (1928, p. 486) figured a specimen of the fossil Cidarid *Tylocidaris clavigera* (König) showing more or less distinct traces of perforation of the upper tubercles, and in respect to the latter two genera designated by Thiéry (1928, p. 180) their primary tubercles on the oral side are non-crenulate and imperforate, while on the oral side they are crenulate and perforate.

Those pits in question seen on the uppermost tubercles (to which acorn-shaped primary spines are attached), are unusually minute and have no ligament at all, and even the pits of the acetabula of the said primary spines as well as those of the other primaries are very small and shallow. So far as I know, these features seem to be different from all of other recent Cidarids in some degree. At the same time it may not be too much to say that such conditions have been derived from those Cidaroids with perforate tubercles, as was considered by Döderlein (1887, p. 41) and Mortensen (1928, p. 486) with regard to the genus *Tylocidaris*.

According to Mortensen (1934, Fig. 4), in *Tylocidaris clavigera* (König) the ambulacral plates are disposed in irregular double series on the peristome, and there are no interambulacral plates, although there were found three plates which do not show any pore. These plates destitute of any pore do not seem to be homologous with interambulacral peristomial plates of the other Cidarids, judging from comparison with the features seen in *P. ohshimai*. In case such plates really exist, as Mortensen considers, they should lie apart from an interradian mid-line. Indeed he says "in regard to the peristomial plates *Tylocidaris* accordingly is a very specialized type, as it is in regard to the specialized character of its primary tubercles" (p. 400).

I stated (1935, p. 387) that *Psychocidaris* appeared to have some resemblance to the cretaceous genus *Tylocidaris*, though quite distinct from the latter. Now it may be fairly safe to assume that *Tylocidaris* is probably a direct ancestor of *Psychocidaris*, based on the fact that in *Psychocidaris* only the ambulacral plates are found on the peristome

and the primary tubercles are imperforate; with regard to this matter, of course, I may call attention to the perforate uppermost primary tubercles found in some of the present species.

It may not at all be surprising if the cretaceous genus should prove to belong to the Psychocidaridae together with the recent form in question; for, although the other members of *Tylocidaris* have not yet been sufficiently studied in respect to the peristomial interambulacral plates, the above-mentioned characteristics in *Tylocidaris clavigera* (König) from the British cretaceous formation were clearly given by Mortensen (1934, p. 400).

Lambert (1907, p. 22) reported that the miocene genus *Sardocidaris* was characterized by the high ridge separating the pore-pairs. However, disregarding this character, Mortensen (1928, p. 486) placed the genus as a mere subgenus of *Tylocidaris*, as already done by Lambert et Thiéry (1910, p. 156). Contrary to this statement, I found the similar character on the ambulacrum of *P. ohshimai* and moreover a high wall between the pores. (The fact that the latter² has been found in *Tylocidaris* should here be recalled). Accordingly, the case of *Sardocidaris piæ* Lambert designated by Lambert (1907, p. 23) may here be reminded.

Concerning the peristomial ambulacral plates, it is highly probable that in *P. ohshimai* these plates are not so variable as in the case of *Histocidaris cobosi* (A. Agassiz), pointed out by Agassiz (1904, p. 29) and Jackson (1912, p. 81).

Whether *Psychocidaris* represents a more primitive type, because of its imperforate tubercles, may be an open question. This is the same reason as *Tylocidaris* was taken into consideration by Clark (1907, p. 182). It is necessary to take also other characters into account and here again the very peculiar condition of peristomial plates must be regarded as one of the main characters of the present form. In other words, probably the imperforate tubercles and the lack of peristomial interambulacral plates combined together indicate the form as an early specialized branch of the great Cidaroid stem.

² See Döderlein (1887, p. 41).

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PLATE 33

Psychocidaris ohshimai Ikeda × 1

Figs. 1-3. Denuded test of larger specimen.

Fig. 1. Abactinal view.

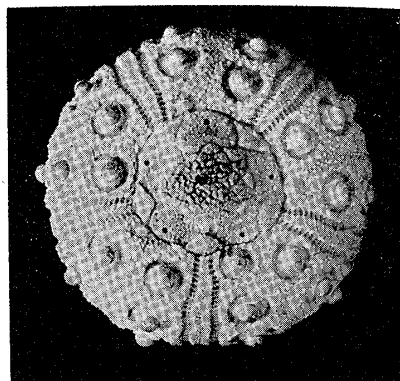
Fig. 2. Actinal view.

Fig. 3. Side view.

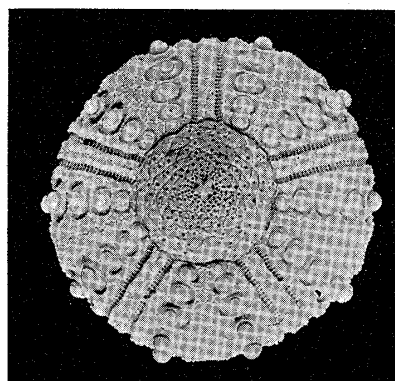
Fig. 4. Abactinal view of same partly denuded.

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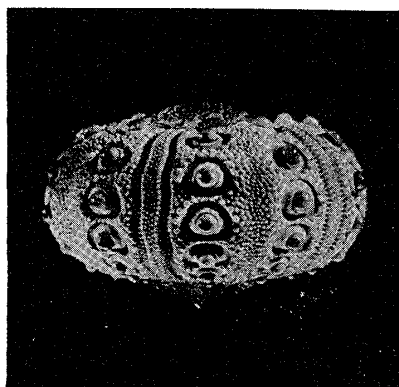
PLATE 33



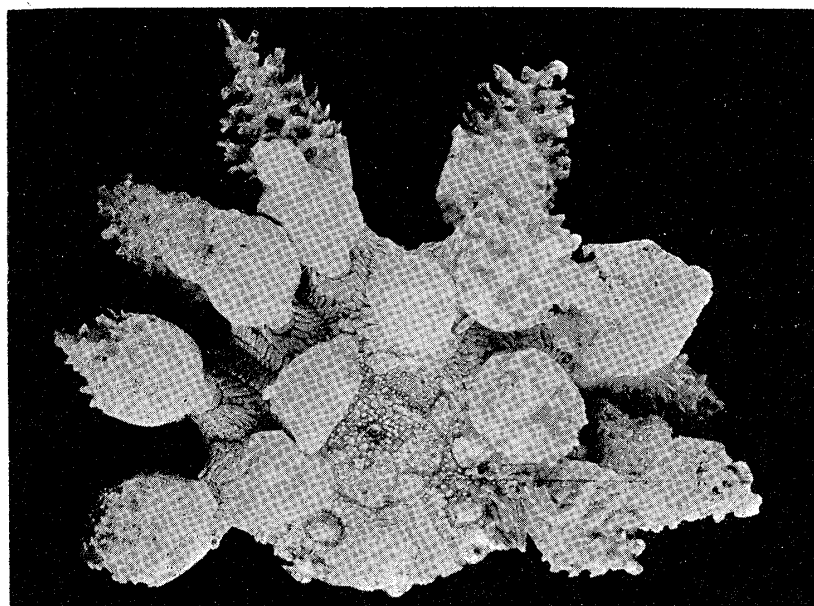
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4

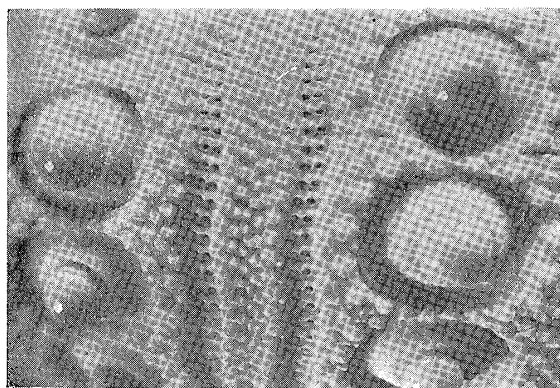
PLATE 34

Psychocidaris ohshimai Ikeda

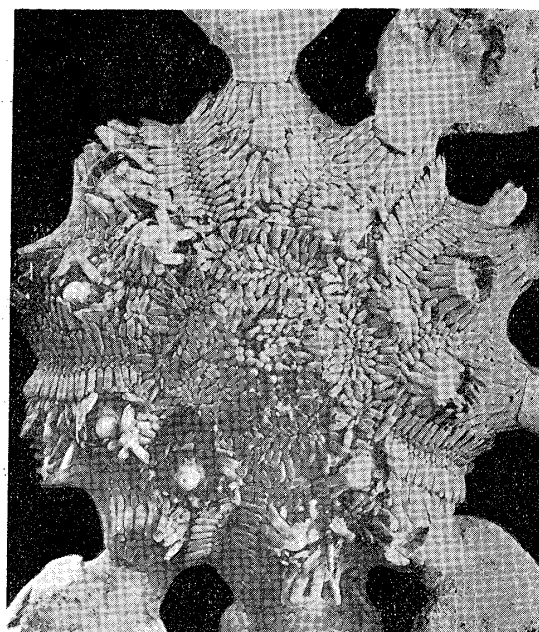
- Fig. 1. Part of ambulacral view of a larger specimen showing pore-pairs. $\times 4$.
Fig. 2. Actinal view of the same specimen showing peristomial ambulacral plates.
 $\times 3$.
Fig. 3. Abactinal view of a smaller specimen with a perforate tubercle showing its
small pit. $\times 1.5$.
Fig. 4. Actinal view of the same specimen partly denuded. $\times 4$.

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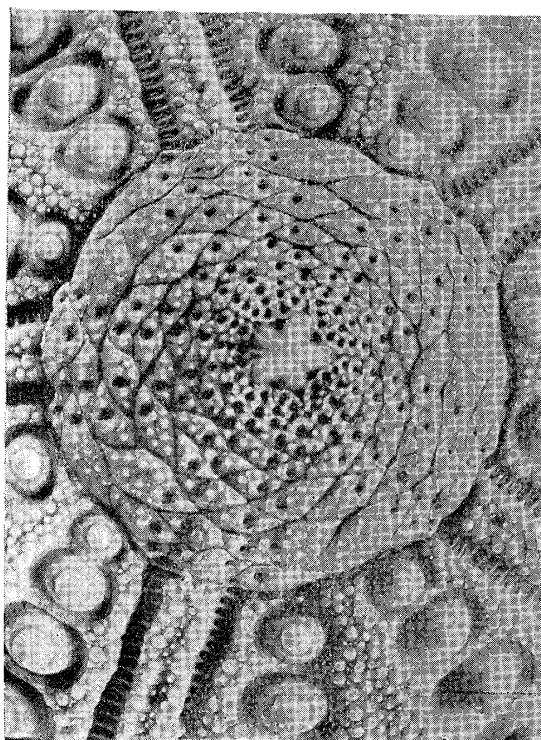
PLATE 34



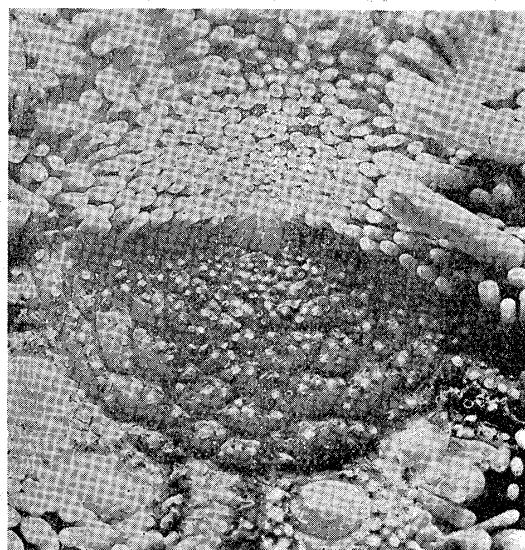
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3



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